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| 09/971,958      | 10/09/2001  | Motoshige Igarashi   | 50090-447           | 4102             |

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McDermott, Will & Emery  
600 13th Street, N.W.  
Washington, DC 20005-3096

EXAMINER

QUACH, TUAN N

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 01/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/971,958

Applicant(s)

IGARASHI ET AL.

Examiner

Tuan Quach

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 12-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### DETAILED ACTION

Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. The limitation in this claim corresponds to the third occurrence of amendment in claim 1 (the insertion after "electrode" at the end of original claim 1). This claim should be cancelled.

Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1 penultimate line, claim 2, and claim 7, "substantially" is indefinite; the term is not defined or characterized in the specification.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akamatsu et al.

Akamatsu teaches gate electrode 3a, impurity diffused regions 6 at both sides of gate 3a, first insulating 15 a covering the sidewalls of the gate electrode. The extension of such L-shaped and only in the vicinity of the gate electrode including "specific range" and including the substantially uniform thickness is apparent or otherwise obvious as shown in Fig. 1(c), 1(d), 2(a), 4(d), 5(c), and 6(a) to define the subsequently doped region 9. The subsequent insulating layer, e.g., layer 12, in Fig. 2(a), 3, and 5(d) is also shown. See the corresponding description, column 5 line 56 to column 7 line 6, column 9 line 1 to column 10 line 40, column 11 line 15 to column 12 line 65. Regarding the respective thicknesses in claims 4-7, such would have been within the purview of one skilled in the art and would have been met as shown in the figures delineated above, and the corresponding description, e.g., column 6 lines 29-34, including e.g., the lateral thickness corresponds to the thickness of the layer 16, hence that of the spacer 16(a) as shown, and as delineated at column 6 lines 3- 40 including the respective insulating thicknesses including expected slight variance due to the vertical sidewalls and the horizontal, flat surface of the gate and the surface of source/drain regions.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akamatsu as applied to claims 1-7 above and further in view of JP 11-274-300.

The reference as applied above does not recite the hollow interlayer insulator.

'300 teach the inclusion of a gap 34 between the gate electrodes 24 to reduce capacitance. See the abstract.

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It would have been obvious to one skilled in the art at the time the invention was made to have included a gap between adjacent gates in Akamatsu since such is conventional and advantageous to reduce capacitance as taught by '300.

Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akamatsu as applied to claims 1-7 above, and further in view of Ohno.

The reference as applied above does not show the low resistance film on the side of the gate and the use of connection to diffused region.

Ohno shows the silicide 7 on the side of gate 8b including connection to region 5b. See the abstract, Figs. 7, 11, 13, and the corresponding description, including column 9 lines 63-67, column 10 lines 63-67, column 11 lines 20-32.

It would have been obvious to one skilled in the art to have included in the above reference the low resistance layer on the side of the gate including connection to diffused region since such is conventional and advantageous as evidenced by Ohno wherein local interconnection having high reliability can be obtained.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akamatsu as applied to claims 1-7 above, and further in view of Braeckelmann et al.

The references as applied above do not recite the low k dielectric constant layer.

Braeckelmann et al. teaches the inclusion of interlevel dielectric 22 including a low k dielectric constant below 3.5. See column 3 lines 42-65.

It would have been obvious to one skilled in the art to have included in the interlevel dielectric the low k dielectric constant material in Akamatsu since such is conventional and advantageous as evidenced by Braeckelmann et al. and since it is

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well known in the art that such low k dielectric material would further reduce parasitic capacitance.

Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

Initially, see the new ground of rejections delineated above. Regarding the "substantially", applicant argues that such language is employed so that the thickness recited is not uniform to the nth degree. Nonetheless, such meaning is not characterized from the original disclosure. It remains that the degree of variation cannot be determined from the specification.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Quach whose telephone number is 703-308-1096. The examiner can normally be reached on M - F from 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Wael Fahmy can be reached on (703) 308-4918. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9318 (Before Final) and (703) 872-9319 (After Final).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Tuan Quach  
Primary Examiner